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ABSTRACTS OF WATER WORKS LITERATURE

The Public Health Law of Colorado. Colorado State Board of Health, 1921. A manual consisting of a compilation of the laws of Colorado relating to public health, including the State Plumbing Code and Regulations Relating to Water Supplies and Sewage Disposal Plants. These regulations go into considerable detail with respect to the disposal of excreta and particularly to the protection of water supplies. Considerable data are also given on the construction of sanitary privies and septic tanks. Plans and specifications for water supplies and for sewage disposed must be submitted to the Board of Health for approval.—*E. S. Chase.*

The Recent Epidemic of Typhoid Fever in Burlington County. D. C. Bowen. New Jersey Public Health News, 9–19, December 1921. An account of a unique and intensive outbreak of typhoid fever resulting from infection by a typhoid carrier of chicken salad at a church supper. (cf. Journal, January, 1922, page 147.)—*E. S. Chase.*

Annual Report of the Reclamation Service, Canadian Department of the Interior, 1920–1921. Data regaring municipal water consumption, in addition to meteorological, irrigation and crop data.—*E. S. Chase.*

Sanitary Protection of Public Water Supplies. Allen Hazen. Jour. N. E. W. W. A., 35: 297–308, December, 1921. Paper outlines various lines of defense for the sanitary protection of water supplies as follows: Ownership of watersheds, sanitary supervision, treatment of sewage of towns on watersheds, purification by natural agencies, filtration and disinfection. The completeness with which these lines of defense are to be utilized depends upon local conditions and necessitates the balancing of costs against the benefits to be secured, and the degree of the hazard. Discussion of this paper brought out other lines of defense such as inoculation against typhoid and care in the handling of typhoid patients on watersheds, as well as necessity for eternal vigilance in the operation of water works systems.—*E. S. Chase.*

Description of the Water Works of the Bridgeport Hydraulic Company. Samuel P. Senior. Jour. N. E. W. W. A., 35: 309–317, December, 1921. The water supply furnished by the Company is obtained from several large impounding reservoirs distributed mainly by gravity and subject to treatment with liquid chlorine. The Company owns considerable area around the reservoir which is being re-forested with red pine. This type of tree has so far proved free from weevils, rust and slugs. It is interesting to note that the typhoid fever death rate of Bridgeport was 2.1 per 100,000 population in 1920. New construction in connection with water works is carried out by the Company directly and has resulted in considerable economy.—*E. S. Chase.*

Repairs to the Standpipe at Bath, Maine. Clarence E. Carter and Walter F. Abbott. Jour. N. E. W. W. A., 35: 318–321, December, 1921. A description of the method of repairing a standpipe, the upper 35 feet of which had failed on account of excessive wind pressure. Costs for the work are also given.—*E. S. Chase.*

Control of Water Waste by House to House Inspection. GORDON Z. SMITH. Jour. N. E. W. W. A., 35: 322–334, December, 1921. An account of the water waste inspection work carried on by the Bridgeport Hydraulic Company. Of the 23,194 service connections of this company, some 4673 only are metered but 48 per cent of the total water consumption passes through meters, due to the fact that the manufacturing and business services are completely metered. This paper points out the reasons why universal metering of service in Bridgeport is not particularly urgent.—*E. S. Chase.*

Typhoid Fever Epidemic at Salem, Ohio. W. H. DITTOE. Jour. N. E. W. W. A., 35: 335–353, December, 1921. A detailed account of the typhoid fever epidemic occurring in Salem in the fall of 1920. Salem, a city with a population of approximately 10,000 had an epidemic of some 884 cases of typhoid fever accompanied by some 27 deaths. It is interesting to note that this outbreak of typhoid was immediately preceded by two outbreaks of enteritis. In the second outbreak some 7000 cases occurred. The water supply of Salem is obtained from a series of driven wells from which the water is raised by air lift and then conveyed by gravity to receiving reservoirs from which it is pumped to the distribution system. One set of wells is poorly located in a district entirely built up with residences and with privies, abandoned private wells and sewers in the vicinity. From one of the other sets of wells the water was delivered to the reservoirs through a line of tile laid in the street parallel to and below sanitary and storm water sewers. The evidence resulting from an investigation of the outbreak showed clearly that an infection of the supply by sewage, leaking from one of the sewers into the gravity line carrying well water to the pumping station, was the primary cause of the outbreak.

It is worthy of note that this supply had been considered above suspicion owing to previously satisfactory analyses and to the absence of any undue amount of typhoid fever in the city. At the same time it was known that certain of the wells were poorly located and that the gravity lines for the well water were parallel to and in close proximity to sewers. An example of hazard is shown by the fact that the main trunk sewer of the city passed within 23 feet of one of the reservoirs, the walls of which were found to be leaky. Active measures were taken to control the epidemic including the chlorination of the water supply. One result of the epidemic was the passing of laws in Ohio giving the State Board of Health greater authority for the control of public water supplies.—*E. S. Chase.*

Some Observations Concerning Water Supply Mains. J. W. LEDOUX. Jour. N. E. W. W. A., 35: 354–366, December, 1921. General comparison of cast iron, cement lined, steel and wood stave pipes together with details of experiences with wood stave pipes, and methods employed in repairing leaky joints in wood pipe. Additional experiences, with wood pipe are given in discussion following the paper.—*E. S. Chase.*

The Disappearance of the Coating from Cast Iron Pipe While Stored in the Yard. SAMUEL E. KILLAM. Jour. N. E. W. W. A., 35: 367–372, December, 1921. This paper deals with the effect of weather upon the protective coatings of pipe stored in yards. In some cases the coating stands the weather for many years, while in other cases it disappears rapidly. The paper is followed by an extended discussion upon the nature of pipe coatings and experiences therewith.—*E. S. Chase.*

Significance of "Hydrogen-ion Concentration" in Water Purification. HARRISON P. EDDY. Jour. N. E. W. W. A., 35: 385–393, December, 1921. A general discussion of what is meant by the term "Hydrogen-ion Concentration" (pH), and considers the effect of variations in pH upon the alum treatment of waters. It is pointed out that coagulation with alum takes place most advantageously at some given pH and that the pH control of water purification plants may result in certain advantages, as the prevention of passage of alum through filters and after-precipitation in mains; prevention of corrosive action; control of small plant and animal life; possible reduction in size of filter plants and possible increase in efficiency of operation. The paper concludes by pointing out the importance of further studies with respect to effect of pH control in water purification.—*E. S. Chase.*

Rainfall in New England. Jour. N. E. W. W. A., 35: 397, December, 1921. Corrections in rainfall tables published in the June 1921 JOURNAL.—*E. S. Chase.*

Determination of Maximum Run-off by Stream Gauging. E. D. BURCHARD. Proc. 33d Annual Meeting Iowa Eng'g Soc., 32–37, 1921. This paper describes in general the selection and establishment of stream gauging stations, the instruments required and the methods employed in making observations. The difficulties of accurate determination of flood flows and the methods for overcoming these difficulties are given in detail.—*E. S. Chase.*

Water Purification in Iowa. JACK J. HINMAN, JR. Proc. 33d Annual Meeting, Iowa Eng'g Soc., 117–125, 1921. There are some 475 municipal water works in Iowa and only 33 are provided with purification plants. This does not mean that the Iowa water supplies are of unquestionable quality, as many of the wells and all of the surface supplies are probably unsafe. Furthermore the well waters are frequently high in iron content and in mineral solids. Purification plants in Iowa fall into four general classes: chlorination, iron removal, filtration, coagulaton and sedimentation. The first two classes are used for ground water only and the last two for surface supplies. Many of the filter plants are poorly operated with inadequate technical supervision and laboratory control. The paper concludes with data showing a high resistance to heat and chemicals, of gas producing, spore forming organisms found in polluted waters.—*E. S. Chase.*

Replacement of Old 12-inch Cast Iron Pipe with 24-inch Cast Iron Pipe. THOMAS P. WOLFE. Eng. & Cont. 56: 545, December 14, 1921. An account of the methods employed in removing an old 12-inch pipe and replacing with a new 24-inch pipe. The 12-inch pipe was parallel to a 20-inch pipe and was cross connected therewith every 4000 feet, this being the length of pipe replaced at one time. The 12-inch pipe was stripped by a digging machine followed by men digging out around the joints; the joints burnt out with oxyacetylene torches and the pipe removed by a derrick. After removal of the pipe the ditch was cleaned and the new pipe laid in the usual way. The old 12-inch pipe after nineteen years of service was found in good condition and was used elsewhere.—*E. S. Chase.*

An English Groin Arch Service Reservior. Eng. & Cont., 56: 550–551, December 14, 1921. A description (cf. Concrete and Constructional Engineering, London) of a covered concrete reservoir constructed at a contract price of about $13,608 per million gallons. The reservoir, hexagonal in shape, covers an area of 3.6 acres, has a capacity of 30 million gallons and a total depth of 32 feet. The roof consists of concrete domes supported by pillars built of concrete blocks. The article describes in detail the character of concrete used and the design and construction, of the floors, pillars, groins to domes, domes and sidewalls.—*E. S. Chase.*

State Control of Water Supplies. Eng. & Cont., 57: 40, January 11, 1922. An abstract of a report of a committee on water supplies submitted last year at the Boston Conference of State Sanitary Engineers. From an investigation made by this Committee it appeared that in most instances the divisions of of sanitary engineering of state health departments were inadequately manned to perform the duties which should rest upon them. The Committee recommended that the State Health Department approve plans for proposed public and quasi-public supplies, supervise existing water supplies, make investigations relative to the necessity of public water supplies, control sewerage, sewage disposal and industrial waste disposal, apply remedial measures to suppress water-borne typhoid fever epidemics, coöperate with the Public Health Service in the matter of water supplies for drinking and culinary purposes on common carriers, and give general advice relative to the protection of private water supplies.—*E. S. Chase.*

Tests of Centrifugally Cast Steel. George K. Burgess. Bureau of Standards, Technologic Paper No. 192. This paper presents the results of tests of six hollow steel cylinders, cast by the Millspaugh centrifugal process. The pieces, both as cast and after various heating treatments, were examined as to their physical and chemical properties and the investigation was planned to show the possibilities of substituting heating treatment for forging in this type of casting. The outside surfaces of the cylinders, which were cast in a machine revolving about its horizontal axis, were fairly smooth but the inner surfaces were rough with some evidences of "unsoundness" and with small blow holes within one sixteenth ($\frac{1}{16}$) inch of the inner surface.

Analyses of samples, taken from various points in the castings, showed a slight radial segregation of the carbon, phosphorus and sulphur, with gradual increase from outside to inside of all castings. The mechanical properties indicated somewhat greater strength, elastic limit and resistence to shock, but less ductility, in the tangential than in the longitudinal direction. Determination of the internal stresses showed the outer zones to be in compression. The effect of various heat treatments in improving the physical qualities was most marked.

These tests of centrifugal cast steel cylinders are of some coincident interest in connection with the DeLavaud process of centrifugally casting water pipes.—*F. A. Barbour.*

Stresses in Horizontal Pipes on Rigid Saddles. Theodore B. Parker. Eng. News-Record, 87: 306, August 25, 1921. A rational basis for the design of large horizontal pipe lines with supporting saddles or cradles, where it is necessary to depend on the saddles for lateral support. Mathematical development and resulting tables.—*E. Bankson.*

Repairing Wood Water Conduit at Norfolk, Va. J. W. Ledoux. Eng. News-Record, 87: 396, September 8, 1921. Ten miles of 24 inch machinebanded pumping main, leaking so badly as to appear hopeless, successfully repaired by $1\frac{1}{4}$ inch by $\frac{3}{16}$ inch iron bands over rubber gasket at the joints and some iron bands between joints. Leakage developed after the pipe had assumed an elliptical shape due to excessive earth fill with low internal pressure after which the internal pressure increased and forcing the pipe again to circular form opened up the side stave joints. Wood pipe should be continuously subjected to the pressure under which it is designed to operate. The earth covering should be in keeping with the internal pressure.—*E. Bankson.*

Problems in the Chlorination of Water. Eng. News-Record, 87: 392–444, September 8 and 15, 1921. Seventeen operators give experience with respect to problems in the chlorination of water.—*E. Bankson.*

B. welchii, Gastro-Enteritis and Water Supply. SIR ALEXANDER HOUSTON. Eng. News-Record, 87:484, September 22, 1921. Comparison is made between slow and rapid filters, with a warning against the use of "short cuts to purity." Statement applied to mechanical filtration and against the dependence in chlorination as a substitute for pollution removal. There is some doubt whether B. welchii is a spore former and if so "even the *chlorinators* will readily admit that it is impracticable to kill the spores of bacteria, although it is not proven that B. welchii is a cause of intestinal disturbances." Finally, the B. coli test still remains supreme.—*E. Bankson.*

Problems and Progress in the Water Works Field. ALLEN HAZEN, GEORGE C. WHIPPLE, HARRISON P. EDDY and others. Eng. News-Record, 87: 496, September 22, 1921. Sanitary protection of water supplies is advisable, even with filtration, provided the cost of catchment area is within reason to give more than one line of defense.

The qualities of the water supplies of Massachusetts are reasonably satisfactory and well safeguarded against constant pollution, but any unfiltered supply is subject to accidental contamination. The time is not far distant when the people will demand the filtration of all surface water supplies.

Hydrogen-ion concentration means concentration of acidity or of alkalinity and shows the intensity.

The true value of this determination is yet to be proven but there is little doubt that it will permit of a more intelligent study of water. This fact alone is sufficient to warrant determining the pH value in many cases.—*E. Bankson.*

Testing and Calculating Aluminum Sulphate Solutions. CHARLES H. CAPEN, JR. Eng. News-Record, 87: 574, October 6, 1921. A method for readily checking the amount of aluminum sulphate applied to a given water supply is described in this article.—*E. Bankson.*

Manganese Bronze for Water Works Valve Stems. WILLIAM R. CONRAD. Eng. News-Record 87: 575, October 6, 1921. Specifications are given for the particular bronze which will produce the best valve stems.—*E. Bankson.*

Making Chlorine Gas at the Point of Consumption. CLARENCE W. MARCH. Eng. News-Record, 87: 648, October 20, 1921. Recently there has been developed an electrolytic cell battery for producing chlorine at your water plant, at a cost of 20 per cent less than present methods and very little space is required.—*E. Bankson.*

Tastes and Odors in Water Due to Low Oxygen Content. F. H. WARING. Eng. News-Record, 87: 771, November 10, 1921. Tastes and odors in water from Maumee River, in winter, are due to lowered dissolved oxygen content brought about by a long continued ice layer and causing anaerobic bacterial decomposition.—*E. Bankson.*

Loss of Head as a Criterion for Washing Filters. JAMES W. ARMSTRONG. Eng. News-Record, 87: 1060, December 29, 1921. A new turbidity detector, virtually a Tyndall meter, has been developed for indicating the time for washing filters, replacing the loss of head method.—*E. Bankson.*

Electric Control and Operation of Water Valves at Buffalo. GEORGE C. ANDREWS. Eng. News-Record, 88: 186, February 2, 1922. Buffalo has just equipped 15 of the large valves in its distribution system with electrical operation and Dean control apparatus to open or close in eleven minutes, replacing many men for several hours. This gives immediate control of valves which are easily tested once a week.—*E. Bankson.*

Special Cast Iron Pipe used for Whittier Water Works. E. A. ROME. Eng. News-Record, 88: 198, February 2, 1922. Whittier, Cal., effected a desirable saving in cost of cast iron pipe by specifying a tensile strength higher than the American Water Works Association standards, resulting in a lighter weight pipe for the same head.—*E. Bankson.*